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THE IMPACT OF FEDERAL REGULATIONS  
ON  
THE CONSTRUCTION INDUSTRY

BY  
MICHAEL L. HILL  
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A REPORT PRESENTED TO THE GRADUATE COMMITTEE  
OF THE DEPARTMENT OF CIVIL ENGINEERING IN  
PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF MASTER OF ENGINEERING

UNIVERSITY OF FLORIDA

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## ABSTRACT

With over 116 federal regulatory agencies on the books, the impact of their actions is far-reaching. Studies performed by internal governmental review and by private research organizations show that approximately 10.2% of the yearly construction costs were allocated for regulatory controls. A 1975 GAO report showed a growth rate of over 10,000 new regulations each year between 1970 and 1975, at an annual budget of \$60 billion for all the federal regulatory agencies. The percentage cost of social, labor, and environmental regulations per construction project can be summed up in the following:

Inflation - Unknown

WAGE Laws - Unknown

EEO rulings - 12.5%

MBE rulings - 3.6%

OSHA regs - 1.8%

EPA regs - 3.0%

Although the percentages are not cumulative, figures show that the costs are significant. The complex nature of this problem makes any analysis very subjective and open to debate. The political debate over social, labor, and environmental impact on construction has been waged for a number of years. There still remains much uncertainty about the full impact of federal regulations on the construction industry and it largely depends on social opinion and the current administration as to which way the pendulum will swing.

## CHAPTER ONE INTRODUCTION

The United States has become the most industrialized nation in the world within the last one hundred years. Along with the proliferation of the industrial revolution at the turn of the century came the complexities of managing the rapid growth of the American economy. Americans witnessed the transformation of small family-owned businesses into large international conglomerates, employing hundreds of thousands of workers. Major factors that affected this dramatic change in the face of our nation were its abundant resources, the imagination and creation of its people, and the form of government that allowed for unimpeded growth.

Men of vision and wealth quickly moved to harness America's resources and turn them into a monetary gain. Their drive became so obsessive that they abused many of the natural resources and attempted to create monopolies wherever possible. The American society was not going to allow these policies to run rampant and began pressuring the federal government to intervene, and thereby caused regulatory controls to be placed on various areas of industry. As much as any other industry, the construction industry has felt the impact of federal regulations.

The purpose of this paper is to describe the economic, social, and environmental factors that have influenced the growth of federal regulations and to describe the specific impacts, both positive and

negative. In most regulatory concerns, government intervention is in the "best interest" of the public, therefore, when doing any type of cost analysis, it is extremely difficult to put a dollar value on the "best interest" of the public. The analyst is merely adding individual speculation when valuing time, life, and the quality of the environment.

It is of general consensus that the major impacts on the construction industry have come from social, labor, and environmental regulations, therefore, the preponderance of this paper will be spent dealing with issues in these areas. No one can attempt to assess the impact of federal regulations unless they understand how and why they came into being; therefore, this paper will present a brief background of the advent and growth of government regulations. After looking at the impact and results of these regulations, comments will be made on what is currently being done in the area of regulatory reform and projections will be made on the outlook of future reform. The social pendulum swings back and forth throughout time - this paper will follow its "arch of influence."

## CHAPTER TWO DEVELOPMENT OF REGULATIONS

### DEFINING REGULATION

"Regulation", as defined by Webster is a "rule, ordinance or law by which conduct is regulated". In a business sense, regulation has been more aptly defined by the Senate Governmental Affairs Committee, in its January 1977 Report ("Study on Federal Regulation", Vol. I) as "one which has decision-making authority, establishes standards or guidelines conferring benefits and imposing restrictions on business conduct, operates principally in the sphere of domestic business activity, has its head and/or members appointed by the President...[generally subject to Senate confirmation], and has its legal procedure generally governed by the Administrative Procedure Act."

Of all the regulators that effect our everyday life, the federal government is the largest. Virtually everything it does has a controlling impact on some part of society. Without exception, the construction industry has been seriously impacted by the onslaught of federal regulations.

The commerce clause of the Constitution grants to the government the legal authority to regulate. Article I, Section 8 empowers Congress "to regulate commerce with foreign nations, and among the several states..."

Moreover, there are two categories of regulations: (1) "Traditional" regulations that are usually aimed at specific industries and pursues essentially economic objectives, and (2) "New" regulations that cut across

industry lines and pursues non-economic objectives. Examples of these "new" agencies are the Consumer Product Safety Commission (CPSC), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA).

The General Accounting Office (GAO), in a 1978 report on government regulatory activities put the number of independent and executive branch agencies engaged in regulation at 116. Admittedly, the regulatory powers and activities of each agency varies, but they all have a definite impact on the private sector.<sup>1</sup>

#### REASONS FOR REGULATION

The American economy combines both private ownership with public control. Any enterprise that bears on the "public interest" demands a measure of public oversight. Regulations that deal with public welfare are aimed at protecting the health and safety of people as workers or as consumers. The basic purpose of regulation is to correct for market failures, either where competition does not exist or where resources are not allocated properly. One of the most common areas for regulation is where a "natural monopoly" exists, i.e., electric power and utilities. The economies of scale in these industries are so great that the largest firm would have the lowest costs and therefore could drive its competition out of business.<sup>2</sup> Hence, Congress passed laws and the Executive Branch of the Government enacted policies and executive orders to the commodities market and the labor force to induce a competitive market.

Destructive competition - that could lead to deterioration of product quality and to monopoly - is another reason for regulation. Regulation



may also be necessary to guarantee services to areas that would otherwise be ignored by the market, such as train and airline service to small towns. However, the added cost of these services are passed on to others that do not benefit from them.

Areas in which the nature of the goods being bought is so complex that consumers may be incapable of making intelligent decisions on their own require some regulation. Drugs, insurance, and medical services are examples of complex markets. Occupational safety and health regulations are examples of areas where markets work imperfectly because of inadequate information. Workers do not know the risks they face on various jobs and may not be able to acquire the necessary information themselves.

Another form of market imperfection which requires regulation involves what economists call "externalities", where the action of one person or firm could have a harmful effect on others. Externalities include air and water pollution which increases the costs of some firms over the costs of others, as well as increasing society's costs in environmental clean-up, illness and health care. In these situations, voluntary steps to deal with these problems could place a company at a competitive disadvantage, therefore, the only way to ensure fair competition is through government regulation. In these cases, the benefits of eliminating these externalities have to be weighed against the cost of regulation. The difficulty lies in the task of putting a price on human life or on the quality of the environment.<sup>3</sup>

#### HISTORY OF REGULATION

Regulation is as old as human society. Business regulations can be found in the Old Testament and construction regulations are cited in

the Babylonian Code of Hammurabi. The Roman Empire established price fixing for hundreds of goods; and during the Middle Ages the Catholic Sovereigns regulated commerce by setting a "just price." The medieval feudal organizations in Europe established a mercantilist system, and carefully regulated cost and quality, as well as production, both directly and through corporations and trading companies.

The Age of Mercantilism ended, however, after the publication of The Wealth of Nations by Adam Smith in 1776, which was the fundamental work of modern economics. Smith attacked mercantilism and argued:

The merits of laissez-faire competition was motivated by the individual for his own selfish gain, which if let run its course would achieve the best results for all...

Thus, resulted the free competitive market.

Britain and America fully endorsed the use of laissez-faire and allowed it to go unchecked up until the nineteenth century. Early America was predominately a rural nation with no great nationwide businesses, therefore, the government was more interested in encouraging exploitation of the nation's resources than in controlling their use. The government exerted its influence on the economy by making internal improvements, patenting inventions, granting public lands to homesteaders and railroads, and imposing protective tariffs to nurture infant industries. This era also developed periodic business crises, waste of precious natural resources, and large-scale social inequity and corruption. A few businessmen came to disprove Smith's theory of free competition, by using manipulative devices to dominate certain industries.

Governmental regulations that existed in the nineteenth century were provided almost entirely by statutes and enforced in the traditional manner - through the court system. The courts proved to be inconsistent, ineffective, and immobile in dealing with the complexities of the modern industrial economy. Therefore, their failure paved the way for administrative controls through agencies and commissions. Under this system, the legislature provided only the broad mandate for a particular regulatory scheme, and allowed the agency authority to implement more specific guidelines. The agencies and commissions were given power to prescribe regulations having the force of law, to police those subject to its authority, and to decide cases involving possible violations - legislative, executive, and judicial power all in one body. In theory, the agency would be able to provide the continuous supervision and expert knowledge that could not be expected of the legislature. Up until this point agencies such as the Army Corps of Engineers (1824), Patent and Trademark Office (1836), Comptroller and Currency (1863), Copyright Office of the Library of Congress (1870), Bureau of Fisheries (1871), Internal Revenue Service (1862), and the Civil Service Commission (1883), were set up to facilitate administration of the government itself.

Behind landmark Supreme Court cases of Munn vs Illinois and Wabash, St. Louis and Pacific Railway Co. vs. Illinois, Congress established the first federal regulatory agency, the Interstate Commerce Commission (ICC), which was brought about with the passage of the Interstate Commerce Act of 1887. Robert E. Cushman explained the importance of this event in his book The Independent Regulatory Commissions:

The crucial problem in 1887 was not whether railroads ought to be regulated; it was whether the time had come for the national government to take over the task of regulation. The Interstate Commerce Commission was an innovation not because it was endowed with a new type of power, but because it represented a new location of power in the federal system.

The ICC extended governmental authority from punishing wrongful acts after they were committed to preventing their occurrence.

#### DEVELOPMENT OF REGULATORY AGENCIES

The ICC and its organizational setup served as the prototype for regulation by independent commissions as federal regulatory powers expanded into other areas of industry and commerce. As the ICC was tasked to oversee broader areas of commerce, additional congressional laws were passed to give it more power. Even with this increased power the ICC could not handle the full load placed upon it, therefore, Congress created a series of new agencies, patterned after the ICC, beginning with the Federal Reserve System (1913), the Federal Trade Commission (1914), the Tariff Commission (1916), Commodities Exchange Authority (1922), the Federal Communications Commission (1934) and the National Labor Relations Board (1935). As industries became more complex, the government saw a need for federal oversight.

President Roosevelt's New Deal Era provided a high-water mark for the creation of regulatory agencies intended to ensure certain economic goals. It also set the stage for the proliferation of non-economic or social regulation that characterized the late 1960's and 1970's. A 1949 "Task Force Report on Regulatory Commissions", included in the Hoover Commission Report, summed up the arguments that traditionally have been advanced in support of the independent commission system:



2

The purpose of regulation should be to correct or prevent abuses without impeding the effective operation of the industry or imposing unnecessary expense or waste.

This can be done only if regulation is framed with knowledge of the conditions of the industry. Otherwise, the rules will either fail to achieve their purposes or needlessly interfere with private management...The regulated industry is frequently complex or highly technical. Its problems can be understood only on the basis of constant study and analysis of the developments of the industry. Thus the regulating agency must be able to give continuous attention to the area of regulation in order to achieve this essential familiarity or expertness.

The commission form is designed to assure expertness or at least familiarity with the problems of the regulated field both through the members of the commission and through the staff. Devoting their full time to the particular industry or activity, the staff and members become fully familiar with the technical aspects of the industry and its basic problems through their day-to-day contacts.

#### SURGE OF REGULATIONS IN THE 1970'S

Although many of the major "old line" regulatory agencies were established during the New Deal Era, the early 1970's saw a new wave of federal regulations ride the crest of public outcry. Headed by people such as Ralph Nader and Senator Proxmire, and groups such as Greenpeace and The Sierra Club, both social and environmental issues were brought to the forefront. Agencies such as the Equal Employment Opportunity Commission (EEOC), the Environmental Protection Agency (EPA), the Consumer Product Safety Commission (CPSC), and the Occupational Safety and Health Administration (OSHA) were formed. The energy crisis of the early 1970's caused Congress to try to put together a comprehensive national energy policy. Therefore, in 1973, Congress set up the Federal Energy Administration.



Not only has the number of regulatory agencies grown, but also the number of employees. The EPA which employed 3,860 persons in 1970 had 10,678 persons by 1980. OSHA increased from 1,558 positions in 1972 to 2,799 by 1980. Within the first month of OSHA's creation, the agency had adopted over 4,400 standards from existing federal regulations, industry codes and the National Standards Institute. The ICC also grew from 1,060 positions in 1951 to 1,880 positions in 1980.

Although the budgets of regulatory agencies are only a small fraction of the total federal budget, it has been estimated that the operating costs of 41 agencies grew from \$2.2 billion in fiscal year 1974 to \$4.8 billion in fiscal year 1979, a growth of 115 percent over a 5 year period.<sup>4</sup>

### CHAPTER THREE OVERVIEW OF REGULATIONS

#### GENERAL OVERVIEW OF SOCIAL, LABOR AND ENVIRONMENTAL REGULATIONS

As described earlier in this paper, there are some 116 active regulatory agencies within the federal government and hundreds more state and local agencies. To try to estimate their total impact on the construction industry would be an impractical, as well as an impossible task. However, not surprisingly, Pareto's Law of 80% of the cost can be found in 20% of the items applies in the area of federal regulations. Consequently, this paper will focus on the areas of federal regulations that have the greatest impact on the construction industry - namely factors influencing inflation, wage law decisions, Equal Employment Opportunity (EEO) rulings, Minority Business Enterprise (MBE) regulations, OSHA, and EPA regulations. It is generally perceived by both owners and contractors in both small and large firms that these five areas have added considerably to business frustration and business failure.

There have been several studies conducted to attempt to determine the cost of social, labor, and environmental regulations as applied to a specific construction project. Enno Koehn reported the results of a survey conducted in 1976 designed to determine the percentage of construction cost spent for social and environmental controls for various sources of pollution. The results of his research are found in Table 3.1 which indicated that approximately 10.2% of the yearly construction costs were allocated for regulatory controls.

TABLE 3.1 - SOCIAL AND ENVIRONMENTAL COSTS OF CONSTRUCTION

SOURCES OF POLLUTION	APPROXIMATE PERCENTAGE OF CONSTRUCTION COST SPENT FOR SOCIAL AND ENVIRONMENTAL CONTROLS
Runoff, Drainage and Ground- Water Control	2.47
Clearing and Grubbing, Felling Trees and Stumping	2.12
Excavation	1.61
Asphalt, Concrete and Aggregate Production	0.39
Concrete Construction	0.78
Steel Construction	0.98
Waste Disposal	1.04
Other	0.82
<hr/>	
TOTAL	10.21

Source: Journal of the Construction Division, ASCE  
Vol. 104, No. C02, June 1978

DATA BASE

The data in Table 3.1 was obtained by distributing a questionnaire to a selected number of construction firms. Those firms receiving the questionnaire were "The ENR 400" as compiled by Engineering News Record, and smaller firms as those that appeared in "The OCA Directory" as published by the Ohio Contractors Association. These firms represented a combined construction volume of \$65 billion.

The questionnaire utilized is shown as Figure 3-1. A total of 195 usable responses were returned representing a total volume of \$8.923 billion.<sup>5</sup>

In complying with all of the federal regulations on construction projects it has added considerably in the cost of prequalification, record keeping, monitoring, testing, and administration. These costs get passed on directly to the client, and moreover, construction delays have resulted in significant cost increases. Each of the areas that have a dramatic impact on the cost of construction shall be looked at in further detail.

## SOCIAL AND ENVIRONMENTAL COSTS IN CONSTRUCTION

Have social and environmental controls on construction increased construction costs for your organization?

Hardly at all \_\_\_\_\_

Quite a bit \_\_\_\_\_

Substantially \_\_\_\_\_

Do you feel that:

Good accepted construction practices satisfy these requirements of social and environmental controls? Yes \_\_\_\_\_ No \_\_\_\_\_

Do you feel that the requirements of the environmental and social control laws and regulations apply to the work of your company? Yes \_\_\_\_\_ No \_\_\_\_\_

Please list the approximate percentage of construction cost spent by your company for social and environmental controls due to present requirements of:

Environmental Protection Agency (EPA)

Occupational Safety and Health Act (OSHA)

Nuclear Regulatory Commission (NRC)

Equal Employment Opportunity Commission (EEOC)

Delays attributable to Federal, State, and City  
Agencies, or ordered by the Courts

Other Causes (Please explain)

\_\_\_\_\_

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Approximate Annual Volume of your company business (in dollars)

Comments:

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Figure 3-1

Source: Journal of the Construction Division, ASCE  
Vol. 104, C02, June, 1978



## CHAPTER FOUR INFLATIONARY REGULATIONS

### IMPACT OF INFLATION ON THE CONSTRUCTION INDUSTRY

The impact of inflation on the construction industry has permeated into all aspects of the industry. Owners are not only paying for the increased costs of materials, labor, and capital but also for premiums on construction prices because of uncertainties of inflation and its side effects. Contractors are faced with a high degree of uncertainty in bidding and financing work. Productivity is affected because contractors cannot accurately forecast long-term returns on their investments and are required to channel necessary capital to meet resource costs.

In the purest sense inflation is an economic term which applies to the disproportionate and relatively sharp and sudden increase in the quantity of money, or credit, or both, relative to goods available for purchase. Inflation produces a general rise in price levels but, more importantly, causes a decrease in the monetary unit with time, and these consequences are proportionate to the rate of inflation. In construction, it is vitally important to be aware of the impact of inflation because if not taken into consideration, the possible outcomes include selecting incorrect alternatives, underestimating budgets, and overstating profits. Some think that inflation is a neutral factor because of indexing, which is a means of discounting actual dollars to "real" or inflation-adjusted dollars. However, these adjustments do not account for other effects,

such as individual price distortions or hidden costs resulting from the inability to forecast return on one's investment. Still others in the construction industry try to ignore inflation, believing it to be a temporary phenomenon, but logic and experience teach us that inflation will have long-term effects upon the industry.

#### FACTORS AFFECTED BY INFLATION

This chapter will provide a thumbnail sketch of the areas in which inflation impacts the construction industry, but will more importantly show how and why federal regulations "fuel the flames" of inflation. Inflationary regulations by the Federal Reserve or Labor Department escalate interest rates which cause those increases to be passed on to the consumer.

Costs - The unique characteristics of the construction industry make it highly susceptible to inflation. Probably the two major areas of cost increases in the last fifteen years have been wages and energy.

Labor - The industry has shown an overall annual pay increase of 10-11% in 1981 and 1982 according to an Engineering News-Record report.<sup>6</sup> With interest rates plummeting, construction starts should increase dramatically causing further increases in pay rates.

Materials - Construction materials make up approximately 55% of the cost. The various concentration levels of resources have caused the cost of procuring those resources to fluctuate, thereby making the impact of inflation difficult to estimate.

Equipment - Equipment costs are labor-dependent, thereby making it very sensitive to market and interest rates. Equipment intensive projects have been more risky in the recent past because of uncontrollable fuel prices.

Interest Rates - When contractors decide whether to undertake construction projects, they must consider interest rates because contractors often operate on borrowed money, thereby making interest rates critically important to the construction industry.

Overhead Costs - Overhead costs for most firms consist primarily of supervisory salaries and general office and administrative expenses. Overhead cost increases as the inflation rate increases.

Taxes - Depreciation allowances erode as the inflation rate goes up, causing a significant impact on the owner's ability to finance new projects. Depreciation is also a major consideration in the purchase of construction equipment which offsets large capital outlays.

Profits - Profits in the construction industry are reduced by the aforementioned factors. Additionally inflated cash flows distort the profitability picture causing construction firms to believe that they are better off financially than they really are.

Many factors go into the determination of the inflationary effects of federal regulations. Many economists point to the consumer price index (CPI) as a gauge of inflation, however, the CPI does not tell the whole story, and consequently using a cost/benefit criterion method we get a more accurate picture of the factors that cause inflationary effects on the construction industry. It has been recognized that the major determinants of the rate of inflation are fiscal policy and monetary policy. However, any change - from any source - that increases aggregate supply, decreases the real inflation rate, in a real sense, when a governmental action provides benefits in terms of a cleaner environment, safer working conditions, or some other desirable good, and the value of those

benefits exceeds the associated cost, then the aggregate supply of real goods and services available to the public has increased. In such a case, the effect would be anti-inflationary, even though a meticulous tracing of its effect on the CPI might show an inflationary effect. On the other hand, if a proposed regulation would have costs exceeding its benefits, then that regulation must be judged inflationary, since it diminishes the real supply of goods and services available to the public.

Between 1970 and 1975, there was a 25% annual growth rate in the number of federal regulations published. There was an average in excess of 10,000 new regulations each year; and in a 1975 report conducted by the GAO, regulatory controls cost \$60 billion to the economy.<sup>7</sup> This has caused many to question as to whether the quality of regulatory decision making has kept pace with the growth and quantity of the regulatory output.

#### DEFICIENCIES IN REGULATORY DECISION MAKING

In our regulatory agencies we have seen a number of deficiencies in their decision making processes. Several of these deficiencies are

- 1) making important decisions based in insufficient information,
- 2) promulgating regulations whose costs clearly outweigh benefits,
- 3) failing to consider the cost-effectiveness of component parts of a proposal, 4) failing to consider alternative approaches, and 5) a tendency to protect industry from competition. Hopefully, with a better understanding of these problems, the regulatory agencies, Congress, and others may be better able to wrestle with the problem of improving regulatory procedures and thereby raising the quality of regulatory decisions.



#### IMPORTANT DECISIONS BASED UPON INSUFFICIENT INFORMATION

In many cases when issues come before one of the regulatory agencies not all necessary evidence is brought before the agency. In some cases, what should be "interested parties" are unaware of the stake they have in the outcome of the regulation and therefore fail to present their views. On other occasions, the agency just does a poor job in obtaining the basic information of the issue, and consequently, issues are decided in a vacuum. Moreover, when the general public becomes aware that regulations which affect them have been so cavalierly promulgated without serious consideration being given to the costs and benefits, they tend to lose faith in all governmental institutions.

#### PROMULGATING STANDARDS WHEN COSTS CLEARLY EXCEED BENEFITS

Many instances have been found where regulatory agencies have pressed forward with regulations even when they knew that the costs far exceeded the benefits. Some cases were mandated by Congress, but others fell victim to regulatory inertia: where the proposal had gotten fairly far along before anyone discovered its real impact; in effect it was "too-late" to turn it around.

#### FAILING TO CONSIDER THE COST-EFFECTIVENESS OF COMPONENT PARTS OF A PROPOSAL

In many cases the overall proposal may be justified in terms of costs versus benefits, however, seldom has there been a value engineering approach given to the component parts of the proposal to identify additional cost savings.

#### FAILING TO CONSIDER ALTERNATIVE APPROACHES

In numerous cases regulatory agencies have held steadfastly to traditional views and outdated standards, and have refused to consider



innovative approaches to problems. A spin-off of the value engineering approach is the production of alternative approaches to the problem. Each approach is evaluated and its benefits are computed. Unfortunately, all too often, agencies are tied up by legislative mandates or internal policy. Sadly, it has been disclosed that many agencies simply do not want to admit that some other group or agency has a better idea, i.e., political infighting.

#### TENDENCY TO PROTECT INDUSTRY FROM COMPETITION

It has been observed that in the regulatory decision making process there has been a tendency of the agencies to protect their constituent industry from competition. The irony here is that the regulators have ended up protecting the regulated. Regulatory agencies are established to protect the consumer, however, often the effects of their actions have increased the cost to the consumer and have increased the rate of inflation.<sup>8</sup>

When considering the impact of inflation on the construction industry one must address the degree of risk involved in contracting. When dealing directly with the costs and prices of labor, materials, and equipment one can reasonably forecast one or two years ahead. Beyond that time the degree of uncertainty becomes progressively greater.

#### STUDIES ON THE IMPACT OF INFLATION ON THE CONSTRUCTION INDUSTRY

In a study performed by De Neufville, Hani, and Lesage from 1966-1975, they found that contractors are more risk-adverse during periods of high inflation, in bad years they bid relatively lower because they attach little importance to greater immediate gains.<sup>9</sup>

Another study performed by Erikson, O'Connor, and Rood published in 1978, examined the risks in government-type contracts by owners and contractors. They found that during periods of high inflation:

1. Both owner and contractor tend to reduce profit margins. In the long run, the gambling contractor goes bankrupt, and both owner and contractor lose because of delay and litigation.
2. Competition is eventually reduced. Contractors are less able to bid because the probability of loss is catastrophic.
3. The owner will be paying contingency costs that may be more than they are really worth.
4. If the uncertain events do not occur, the contractor may realize a windfall profit at the owner's expense.<sup>10</sup>

The aforementioned effects were based on fixed-price contracts. Other type contracts such as cost-reimbursable contracts could reduce contractor risks. Escalation clauses also reduce contractor risks, however, the Associated General Contractors (AGC) is opposed to the inclusion of escalation clauses in contracts.

Cost-estimation accuracy fluctuates as the interest rate fluctuates. Short-term projects of 3-6 months can be estimated with accuracy, however, if a project is scheduled to last from 12-18 months or more, then contractors add contingency fees in their bid to hedge against inflation.

#### SUMMARY

The construction industry is not fully aware of the impact of inflation. Inflation discriminates among competitors, where larger firms are more able to absorb the effects of inflation than are smaller firms. The true costs to owners and contractors are rising faster than the prices

causing the constant dollar profits to diminish. Inflation also causes the benefits of taxation and depreciation to decrease.

Regulatory agencies must work to reduce the number and kinds of decision making deficiencies. The general public has little concept of how regulations effect inflation. They tend to think that they are being given a "free lunch", and not realizing that the pursuit of regulatory objectives has had a substantial cost - one which the consumer has had to pay. Additionally, regulatory agencies have no "bottom line" which measures the success or failure of regulatory policies. Since they are the "only game in town," they follow traditional policies and do little value engineering to develop further cost savings and overall improvements in their programs.

## CHAPTER FIVE WAGE LAWS

### IMPACT OF WAGE LAWS ON THE CONSTRUCTION INDUSTRY

Within the United States publicly funded construction accounts for approximately one-third of the annual value of all construction done. Whenever public funds are used to finance construction a number of special contractual provisions are incorporated into the construction contract. Many of these provisions are regarded by the industry as a result of inflation, but by far the Davis-Bacon Act has been the most highly contested regulation and has generated the most political controversy.

There has been several studies done to estimate the impact of wage laws on the cost of construction, but because of the wide dispersion of hourly wages paid in each skill area throughout the United States an accurate and valid survey has not been conducted to date. Proponents, therefore, of each side of the controversy start by making assumptions and then proceed with their argument. It is the basis of these assumptions that make their conclusions suspect.

### THE COWPS STUDY

A comprehensive study performed by the Council on Wage and Price Stability (COWPS) found some surprising results. Using recent Bureau of Labor Statistics (BLS) data on both nonunion and union wages, COWPS showed that Davis-Bacon wages were usually slightly below the union rate

in the same geographical area. Generally, the difference was due to reporting lags. Additionally the Davis-Bacon Act only sets minimum wages and any union contractor would have to pay the current contractual wage. Most importantly, the COWPS Study experimented with different administrative rules for setting a "prevailing wage." In one experiment, it compared the percentage difference between an "average" of union and open-shop rates in an area and the straight "union" rate. For the most part, the "union" rate was not significantly greater than the "average" rate; the average difference between the two ways of computing the prevailing wage was only 3%. Although these margins are relatively small and could be accounted for by statistical error, the COWPS authors nonetheless computed the possible savings, resulting in \$200-600 million in federal construction costs by adopting an averaging rule.<sup>11</sup>

#### THE HUD-MIT STUDY

The Department of Civil Engineering at the Massachusetts Institute of Technology (MIT), in collaboration with the National Association of Homebuilders, completed a study in June of 1978 which surveyed wages and labor management practices in the construction industry. The study was sponsored by the United States Department of Housing and Urban Development (HUD), which surveyed a large number of contractors, both union and non-union, in eight U.S. cities, and covered a wide range of labor management issues.

The wage survey and contractor interview data generated for the HUD-MIT Study correlated a unique comparison of union, open-shop, and Davis-Bacon rates by type of construction. The eight selected cities were:



Boston, Baltimore, New Orleans, Atlanta, Kansas City, Grand Rapids, Denver, and Portland.

Two results stood out from the wage comparisons. First, for commercial construction, nearly all of the Davis-Bacon rates were identical to the union rates in each city. In metropolitan areas such as Grand Rapids, Baltimore, Atlanta, and New Orleans, where there was (and still is) a significant amount of open-shop commercial construction, the wages were on the average, substantially lower than union rates. Therefore, the use of average wages rather than Davis-Bacon prevailing wages in these cities would lower nominal labor costs. Due to the dispersion of wage rates in the open-shop sector, reliance on the "30% rule" virtually guarantees that the union rate will become the prevailing wage even in relatively strong open-shop areas. The "30% rule" states that if 30% or more of the mechanics practicing a given trade are paid a single wage, then that shall be considered to be the prevailing wage. This obviously discriminates in favor of unions who set a single wage for all union journeymen.

Second, for residential construction, the results of the wage comparison was much more varied. Three different patterns were evident in the eight cities:

1. The two cities with relatively low open-shop activity, namely Boston and Kansas City, had prevailing wages that were identical to union commercial rates.

2. In both Portland and Denver where there was moderate open-shop activity, the prevailing rates were higher than the open-shop average wages but were significantly lower than the union commercial rates.

3. In the remaining four cities, which had a nonunion sector, the prevailing rates were lower than the average open-shop rate.

With that kind of diversity in results, it is difficult to make a firm conclusion about the impact of the Davis-Bacon Act on wages - other than more study needs to be done. Clearly, the law and its administration does not tend to raise wages in construction in some cities. While on the other hand, in cities with large union activity, the union commercial building rate does tend to spread over all public construction - even when considerable residential work is apparently open-shop.

#### INDIRECT COST IMPACT OF THE DAVIS-BACON ACT

The indirect effect of the Davis-Bacon Act adds to the total cost of federal construction. Typically ignored are the indirect labor costs borne by contractors (and passed on to the taxpayer) which arise in the administration of the act and the affect on worker productivity.

In most studies the Davis-Bacon wage differential is calculated by simply assuming that the "sole effect" of the Davis-Bacon Act is to raise hourly wage rates for each trade from the average nonunion wage rate to the "prevailing rate," (usually assumed to be the union rate). For a particular project the sum of all the manhours for each trade is then multiplied by the wage difference, resulting in the loss or savings as impacted by the Davis-Bacon "prevailing wage."

The number of manhours required to carry out work are usually assumed to be the same, no matter whether the "prevailing wages" or lower nonunion wages are paid to the workmen. This assumption is ignored by most studies, but is a central point in the analysis of the impact of the Davis-Bacon Act. The findings from the HUD-MIT Study questioned the

validity of that assumption and found the following result. The wage differential ignored the indirect cost associated with occupational structure and skill level rigidities, and the costs of inappropriate or redundant training that could result from the Davis-Bacon Act.

The assumption that labor productivity is unrelated to wage levels is contrary to most economic theories. Results of the HUD-MIT Survey concluded the following:

1. Several of the nonunion contractors interviewed pointed out that by offering higher wages on federal projects they were able to attract workers with more training, expertise, and experience. In loose labor markets, nonunion contractors report that unemployed union journeymen will often apply for work on federal jobs and make no mention of their union membership.
2. Many nonunion contractors have begun to use the difference between wages on public jobs and private jobs as a reward for their most loyal and productive workers.
3. By attracting highly skilled workers and rewarding them with higher wages, it tends to improve worker productivity and quality of work.
4. The MIT Construction Project Management Group concluded that improvements in management techniques contribute greatly to increased labor production. Therefore, when nonunion contractors are required to pay higher wages, management devotes more attention to selecting, training, and supervision of construction workers.<sup>12</sup>
5. The survey indicated that union journeymen required less supervision than nonunion workers within comparable trades. The foreman/

journeyman ratio was 1:2 for nonunion firms, while the foreman/journeyman ratio for union firms was as high as 1:10. Consequently, the impact of the Davis-Bacon Act could possibly result in a reduction in required supervision for nonunion firms on federal projects; this would obviously result in lower labor costs for construction firms.

Results of the HUD-MIT Survey also showed that certain institutional and legal factors in the construction industry would add to the cost differential. These are summarized in the following:

1. The Davis-Bacon Act tends to impose union occupational and skill classifications on the entire construction industry. Even when nonunion wages are adopted as the "prevailing wage," union trade definitions are still used and only union skill levels (journeyman, apprentice and laborer) are permitted. As a consequence, many open-shop contractors who rely on helpers in most of the skilled trades are forced to either classify these workers as "journeymen" and pay the higher wage, or register them in approved apprenticeship programs with State Apprentice Councils (SAC) or the Federal Bureau of Apprenticeship Training in the Department of Labor (BAT). In order to comply with the SAC and BAT rules, nonunion firms have had to design apprenticeship programs along union craft lines. Thus, the combination of the Davis-Bacon Act and Federal/State Apprenticeship rules impose union occupational structures on training in the nonunion sector. Additionally, contractors who normally cross train men or who use an undifferentiated work crew have to report their workers under a particular union occupation. In fact, if the reporting rules were strictly followed, an open-shop contractor would have to pay a "general building mechanic" several different rates at different times depending on whether he was doing ironwork, carpentry, masonry, etc.

2. The paperwork involved in the Davis-Bacon reporting requirements is burdensome and costly. Attempting to accurately report a single worker's time under several occupational classifications would result in additional recordkeeping and additional reporting cost for the employer. The establishment of a SAC or BAT approved apprenticeship program adds to the administrative burden.

Contractors are required to continually submit payroll data to the local Employment Standards Office as evidence that they are in fact paying the "prevailing wage."

All of these nonwage effects may create higher costs for the contractor. The most dramatic nonwage impact is probably the lack of a "helper" classification, since these semi-skilled mechanics play a large role in most open-shop firms.<sup>13</sup>

#### THE AGC REPORT

In a report performed by the Associated General Contractors for submission to the White House and to Congress in 1983, they cited several other problems with wage laws that increased construction costs:

1. The Labor Department will give covered construction contractors only partial credit for contributions to fringe benefit programs unless the contractors make the same contributions whenever they perform private work.

2. The Labor Department has failed to recognize that the scope of a job classification may vary from one area to another according to area practice.

3. If a federal agency does not award a contract within ninety days of bid opening, then the Labor Department may force an after-the-fact change in the applicable wage rates, leaving the low bidder with only two alternatives: accept the new rates or demand that the contract be rebid.



4. The Labor Department has included off-site work in its wage determinations.

5. The Labor Department requires covered construction contractors to submit their payroll records on weekly basis.<sup>14</sup>

#### SUMMARY

Surveys indicate that the Davis-Bacon Act, along with state and local prevailing wage laws tend to raise hourly wages on federal projects. The Davis-Bacon "prevailing wages" tend to fall between the true area average rates and union journeyman rates for most crafts in the cities surveyed. As explained earlier, as the wage increases, productivity increases at the same time, indirect nonwage effects of the Davis-Bacon Act will tend to increase its cost impact beyond any increase in productivity. Most studies performed require that certain assumptions be made and a key issue in the Davis-Bacon analysis is whether these assumptions are valid. Both parties in the Davis-Bacon debate will continue to strengthen their positions in order to force regulatory controls in their favor, however, it is generally agreed that further research needs to be done to accurately determine the true impact of the prevailing wage laws on the construction industry. During the period when union activity was at its height, the regulatory pendulum swung far in favor of strong governmental controls. Now that other externalities have come into play, the need for stringent wage laws is being questioned. The indications are clear that the pendulum is ready to swing the other way.

CHAPTER SIX  
EQUAL EMPLOYMENT OPPORTUNITY REGULATIONS

IMPACT OF EQUAL EMPLOYMENT OPPORTUNITY (EEO) REGULATIONS ON THE  
CONSTRUCTION INDUSTRY

The construction industry represents approximately 10% of the gross national product. As technology becomes more complex and is incorporated into the construction industry, the need for qualified skilled workers will increase. For a number of years the training of these workers has been through union apprentice programs. In recent years, there has developed a number of other methods to train and obtain qualified skilled workers, however, this chapter will address the more traditional view. In the past, membership into many of these apprentice programs has been restricted predominately to white male workers. This produced a predominately white male construction force with no minority or female representation. Here again, the government, acting in the "best interest" of the general public, stepped in and enacted several pieces of legislation to correct the situation.

Federal intervention in the construction industry became very active in 1945 when states established fair employment practices statutes. During the 1950's and early 1960's the civil rights movement shook the American conscience, highlighted by the passage of the Civil Rights Act in 1964. This Act also established the Equal Employment Opportunity Commission (EEOC) to enforce and administer its rulings. At first the EEOC could only investigate charges of unfair employment practices and attempt to mediate,

however, in 1972 with the passage of the Equal Employment Opportunity Act, the EEOC received direct enforcement authority to bring suit against discriminatory organizations. In 1976, the Federal Executive Agency (FEA) guidelines were enacted to ensure equal opportunity in federal contracts. In 1978, the EEOC guidelines and the FEA guidelines were combined to establish one uniform set of requirements under Executive Order No. 11246. This order also established the Office of Federal Contract Compliance (OFCCP).

The EEOC and the OFCCP set specific goals and timetables to comply with their regulations. Many firms have had to modify, reorganize, or refuse to comply with these regulations and have consequently seen their construction costs soar. Others, as a part of good management, have used foresight and planning to make the transition into compliance with the EEOC and OFCCP rulings smooth, thereby, causing little disruption in operation and minimal cost increase.

The EEO regulations have caused an adversarial relationship to develop between two factions of our society: 1) those who want to see EEO regulations abolished, citing increased cost and poor success, and 2) those organizations such as the National Association for the Advancement of Colored People and the Woman's Equity Action League, who feel that without specific goals and timetables, there are no reviewable standards to determine if a contractor has used good faith efforts to implement an affirmative action plan.

According to recent U.S. Department of Labor reports from 1972-1980, they show that black representation has increased sharply in seven skilled labor crafts and has only decreased slightly in three skilled labor crafts. The EEOC has, therefore, seen progress in the construction industry.

Under the current Reagan administration, the EEOC's "wheels of progress" are coming to a grinding halt. Many policies have been modified or abolished and the whole organization is in jeopardy of being cut out. Just as the pendulum swung far in favor of affirmative action and civil rights in the 1960's and 70's, the recent administrative policy trend has caused the pendulum to swing the other way.

#### DATA BASE

A study was performed by Koehn and Jones in 1982 to determine the approximate percentage of construction cost for complying with EEO regulations. A questionnaire was sent to a selected number of contractors. The questionnaire was sent to firms listed in "The ENR 400," and also to smaller firms - those firms that were members of the Associated General Contractors, Building Chapter and the Indiana Constructors Inc. (highway, heavy, and utility contractors). By surveying both groups, a wide range of companies, annual construction volumes, and comments were obtained. The questionnaire is shown as Figure 6-1.

There were 146 usable responses returned representing a total construction volume of over \$10 billion. As a result of the organizations surveyed, approximately 63% of the firms felt that EEO regulations applied to the type of work they performed. Roughly 70% of the contractors agreed that EEO regulations have increased the cost of projects with which they have been involved. Additionally, it was interesting to note that a large majority of the firms felt that EEO regulations did not benefit the general public or the individual contractor. Only 55% of the ENR 400 firms and 31% of the Indiana Constructors felt that EEO regulations

## COST OF EEO REGULATIONS

Have Equal Employment Opportunity (EEO) regulations increased the cost of construction projects with which your organization is involved?

Hardly at all \_\_\_\_\_  
 Quite a bit \_\_\_\_\_  
 Substantially \_\_\_\_\_

Do you feel that EEO regulations benefit:      Yes      No      Unsure

(a) The General Public	_____	_____	_____
(b) The Contractor	_____	_____	_____
(c) The Construction Worker (Minority and Female)	_____	_____	_____
(d) The Construction Worker (other than in (c) above)	_____	_____	_____
(e) Other (Please Explain)	_____	_____	_____

Yes      No      Unsure

Do you feel EEO regulations apply to the type work with which your company is involved?

\_\_\_\_\_

Do good general personnel practices usually satisfy EEO requirements?

\_\_\_\_\_

Should the EEO regulations be modified?  
 If yes, please comment below.

\_\_\_\_\_

Have EEO regulations increased the number of minorities and females on your projects?

\_\_\_\_\_

Have EEO regulations increased the number of qualified minorities and females on your projects?

\_\_\_\_\_

(continued on following page)



Please list the total project cost and approximate cost of complying with EEO regulations on projects in which your organization is involved.	Approx. Total Project Cost (in \$)	Approx. Cost of EEO Record keeping, Documentation, and Recruiting Efforts (in \$)	Approx. on-site cost of low productive personnel hired to satisfy EEO Regulations (in \$)
Bldgs (Residential & Commercial)	_____	_____	_____
Highways	_____	_____	_____
Heavy (including sewer work)	_____	_____	_____
Industrial (including power plants)	_____	_____	_____
Other Causes (Please Explain)	_____	_____	_____
Approximate Annual Construction Cost (in dollars) of Projects with which your Organization is Involved _____			

## COMMENTS

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Figure 6-1

Source: Journal of Construction Engineering and Management, ASCE  
Vol. 109, No. 4, Dec., 1983

benefited minority and female workers. It is noteworthy to point out that the ENR 400 (the larger firms) group felt that it was easier to satisfy EEO regulations and saw a benefit in the requirements, than did the Indiana Constructors (the smaller firms). Most firms, both large and small, indicated that EEO regulations had not increased the number of qualified minorities and females on the construction site. The overall cost of EEO regulations as a percentage of construction cost were: 1.05% for ENR 400 firms and 2.31% for the Indiana Constructors. It should also be noted that in a study headed by Koehn in 1976 distributed to a similar group showed a much higher percentage of construction cost spent in complying with EEO regulations. The ENR 400 firms reported 2.0% and the Ohio Contractor Directory Firms reported 3.4% to comply with EEO regulations. This difference can be explained by either a change in EEO policies or administration, or firms are becoming more familiar with EEO requirements and are incorporating EEO standards into their own management policies.<sup>15</sup>

In a separate study performed by the Arthur Anderson and Company, for the Business Roundtable, they reported that for the year 1977 over \$217 million was spent in complying with EEO regulations by the 48 companies that participated in their study. \$209 million, or 96% of those costs were operating and administrative. Within the different categories of EEO regulations, over 76% of the total cost was spent on affirmative action programs.

EEO regulations required the participating companies to complete more than 3 million pages of information in 1977 in order to supply and maintain records that provided proof of compliance. Participating companies

reported that EEO recordkeeping and reporting requirements were inflexible and made inadequate allowance for companies with proper records of acceptable affirmative action.<sup>16</sup>

#### THE AGC REPORT

In a report performed by the Associated General Contractors for submission to the White House and to Congress in 1983, they cited several other problems with EEO regulations that increased construction costs:

1. At least until 1981, OFCCP placed such a great emphasis on detailed paperwork that its compliance reviews almost inevitably found "deficiencies" in construction contractors' affirmative action programs, providing the agency with an excuse to demand that contractors sign burdensome conciliation agreements.

2. The Carter administration's "Midnight Regulations" would require many federal and federally assisted construction contractors to develop and implement affirmative action programs for the non-craft personnel at each of their establishments.  
[\*Note - stayed by the Reagan administration]

3. OFCCP has sought to exercise jurisdiction over all of the work of all federal and federally assisted construction contractors, even though much of the work is private.

4. The 16 affirmative action steps included in federal and federally assisted construction contracts create an enormous paperwork burden (OFCCP has subdivided the 16 steps into 117 substeps), and ignore the fundamental need to equip minorities and women with the skills to contribute to the construction industry on an ongoing basis.<sup>17</sup>

#### SUMMARY

The construction industry represents a substantial amount of the gross national product, and, therefore, in the "best interest" of the general public, Congress has enacted EEO regulations to ensure that all Americans get "their fair share of the pie." It was industrial abuse by both management and unions that caused the establishment of

the EEOC. Riding the wave of public momentum the EEOC enacted strict goals and timetables for full compliance. As a result, most firms have experienced an increase in construction costs. Firms cite high recruiting costs and high training costs as major factors for the increase. As indicated in the study performed by Koehn and Jones, most firms felt that EEO regulations had not increased the number of qualified minorities and females on the construction site.

The Reagan administration has taken a dim view of most affirmative action programs and has halted most of the actions of the previous administration. Members of Congress have been made aware by AGC, Business Roundtable, and other organizations, that the paperwork burden of recordkeeping and documentation is enormous, and that EEO regulations need to be modified. It is time for the pendulum to swing back toward less constraints and more profitability. The need for EEO regulations still remains, therefore, the construction industry must incorporate EEO policies into its management and make good faith efforts to meet EEO goals if true modifications will be forthcoming.

CHAPTER SEVEN  
MINORITY BUSINESS ENTERPRISE RULES

IMPACT OF MINORITY BUSINESS ENTERPRISE RULES ON THE CONSTRUCTION INDUSTRY

The construction industry is a very competitive business. Statistics show that 5 out of 6 companies go out of business within a 10 year period. Some factors that contribute to these statistics include:

- 1) the ease with which one may enter into the construction industry,
- 2) the large number of contractors compared to the available contracts,
- and 3) the lack of technical and business knowledge on the part of many new contractors.

Despite the fact that these figures relate to all firms, there has been growing evidence that those companies started and owned by minorities are even less successful than others within the industry. In order to ensure that minority owned companies were given the opportunity to succeed in construction, the federal government took steps to aid and protect them and in 1969, President Nixon, under the auspices of the Commerce Department established the Minority Business Enterprise (MBE) Provision. For this provision, a minority business enterprise shall be defined as:

1. A small business that is both owned and controlled by minorities or by women. This means that minorities or women must own at least 51% of the business and that they must control the management and daily operations of the business.

2. Minorities include Blacks, Hispanics, American Indians, Alaskan Natives, and Asian Americans.



3. Also eligible as MBE's are members of other groups, or other individuals, found to be economically disadvantaged by the Small Business Administration (SBA) under Section 8(a) of the Small Business Act, as amended. For this purpose minorities are limited to persons who are citizens or lawful permanent residents of the United States.

4. Women are not by definition a minority. Therefore, businesses owned and controlled by women are included under the general heading of Minority Business Enterprise, but are not to be considered, and may not be utilized to comply with requirements established for business owned and controlled by minorities, unless the business is owned and controlled by a minority woman or has been approved by the Small Business Administration under Section 8(a) of the Small Business Act, as amended.

5. Those firms purporting to be Minority Business Enterprises (minority or female, or both) shall have on file a certification (including 8(a) certification) substantiating their status as a "Minority Business Enterprise" as defined. Certification will be issued as a Minority Business Enterprise (MBE) or Women Business Enterprise (WBE), or both.<sup>18</sup>

#### GROWTH OF THE MBE

In 1971, the Minority Business Enterprise program was succeeded by an executive order instructing the Commerce Department to develop concrete plans and specific goals in cooperation with the Equal Employment Opportunity Commission (EEOC). Yet by 1976, MBE's had still obtained less than 1% of the government's construction dollar volume.

It was concluded that discrimination was still a major factor in the construction industry, therefore, Congress enacted the Public Works Act of 1977, which not only established additional goals for minority hiring but, more importantly, stipulated that 10% of the amount of each public works grant should be expended for minority enterprises. In effect, this removed approximately \$400 million from the fiscal year 1978 Federal Construction Budget.

As part of the Public Works Act it established a two year pilot program under which one federal agency could make all of its contracts available to the SBA for its MBE program and gave the SBA authority to waive bonding requirements under certain circumstances for minorities.

In 1980 and 1981, the earlier bills were extended, however, the MBE established a graduation date for each minority firm in the program, at which time the minority firm would no longer be eligible for assistance but had to enter the mainstream of competitive contracting. The MBE Program has produced some disappointing statistics. Since the establishment of the program, 4,598 minority firms have participated in the program; of these 166 have graduated, and of the 166 less than 1% of the businesses still remain active (as of 1982).<sup>19</sup>

As a result of its poor showing, the MBE program has received considerable criticism. It has not effectively produced viable minority contractors. It has unfortunately created an unproductive process, placing the ill-prepared minority contractor in a tough market, where even majority firms have difficulty in competing. The program emphasized setting aside contracts for minority firms but gave little assistance in proper management techniques.

#### DATA BASE

In order to obtain a data base for determining the benefits and percentage of construction cost spent in complying with MBE rules, a study was performed by Koehn and Espaillat at Purdue University in 1983, by distributing a questionnaire to a select number of contractors. All organizations appearing on "The ENR 400" list as compiled by Engineering News-Record received the questionnaire. It was also decided to send the

questionnaire to a number of smaller firms. The members of the Indiana Constructors, Inc. (highway, heavy and utility contractors), and the AGC of Indiana (Building Chapter) were considered to be representative of smaller contractors. The questionnaire is shown as Figure 7.1.

A total of 193 usable questionnaires were returned representing a total construction volume of over \$10.6 billion. In general, contractors believed the most significant items of concern to be that "MBE requirements should not be mandatory," that "MBE's create more problems than they solve," and that there are "not enough qualified MBE contractors."

Results of the survey showed that 72% of the ENR 400 firms and 84% of the Indiana Constructors felt that MBE regulations have increased the cost of projects with which they have been involved. In terms of construction dollars, the ENR 400 firms showed an increase of 3.32% in cost per project, and the AGC of Indiana showed an increase of 3.77% in cost per project. Most firms felt that MBE regulations did not benefit the public. It was interesting to note that a majority of all firms felt that MBE regulations did in fact increase the number of minority contractors, but they also agreed that MBE regulations did not increase the number of qualified minority contractors. However, as could be expected, the larger firms (The ENR 400) felt it less difficult, more beneficial, and less expensive to comply with MBE regulations than the smaller firms. One explanation for this difference is that the particular type of work done by the small contractors, such as highway or EPA financed work, may be subject to greater agency surveillance. Another reason may be that the larger contractors consider some of the controls to be equivalent to normal operating procedures and, therefore, do not

## MINORITY BUSINESS ENTERPRISE (MBE)

Have Minority Business Enterprise (MBE) regulations increased the cost of construction projects with which your organization is involved?	Not at all	_____
	Hardly at all	_____
	Quite a bit	_____
	Substantially	_____

Do you feel that MBE regulations benefit:	Yes	No	Unsure
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(a) The General Public	_____	_____	_____
(b) The Minority Contractor	_____	_____	_____
(c) The Non-Minority Contractor	_____	_____	_____
(d) The Construction Worker (Minority)	_____	_____	_____
(e) The Construction Worker (non-minority)	_____	_____	_____
(f) Other (Please explain)	_____	_____	_____

	Yes	No	Unsure
Do you feel MBE regulations apply to the type of work with which your company is involved?	_____	_____	_____
In general, do unregulated construction bidding practices usually satisfy MBE regulations?	_____	_____	_____
In general, do unregulated construction contract negotiation practices usually satisfy MBE requirements?	_____	_____	_____
Have MBE regulations increased the number of minority contractors on your projects?	_____	_____	_____

(continued on next page)

	Yes	No	Unsure
Have MBE regulations increased the number of qualified minority contractors on your projects?	_____	_____	_____
Should the MBE regulations be modified? If yes, please comment below.	_____	_____	_____

Please list the total project cost and the approximate cost of complying with MBE regulations on projects with which your organization is involved.	Approx. total Project Cost (in \$)	Approx. Cost of MBE Regulations (in \$)
(a) Buildings (Residential and Commercial)	_____	_____
(b) Highways	_____	_____
(c) Heavy (including sewer work)	_____	_____
(d) Industrial (including power plants)	_____	_____
(e) Others (Please comment)	_____	_____

Approximate Annual Construction Cost (in dollars) of projects with which your organization is involved.

\_\_\_\_\_

COMMENTS

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Figure 7-1

Source: Journal of Construction Engineering and Management, ASCE  
Vol. 110, No. 2, June 1984.



feel that they increase project cost. A third reason may be that certain fixed costs exist but represent a smaller percentage of the total cost for larger firms. In general, major construction firms have at least one person on their headquarters staff whose responsibility is the MBE Program. Conversely small contractors often consider the administration of MBE regulations an added chore for whomever is available.<sup>20</sup>

#### SUMMARY

The MBE was created to try to assist in correcting the wide disparity in the number of minority contractors to total contractors on federal projects. The major reason for the disparity was found to be discrimination, therefore, the federal government intervened in the "best interest" of the general public. Riding the wave of the social movement the MBE gained additional authority and Congress set specific goals for compliance. Most firms were ill-prepared to comply with these regulations, and unfortunately most minority firms were not prepared to take advantage of this opportunity. As a result, even as recent as 1982, less than 1% of the minority firms that participated in the program are still in business. The major factor effecting the dramatic failure rate was a lack of adequate technical and managerial training.

The survey performed by Koehn and Espaillat showed that most contractors agreed that MBE regulations increased the cost of construction - 3.32% for the ENG 400 firms and 3.77% for the AGC Indiana Firms. The great majority of organizations felt that MBE regulations should be modified.

It appears, however, that the MBE problem will only be solved when non-minority organizations in good faith, and without government coercion, are given the opportunity to develop a system designed to recruit and

train minority contractors. During the 1970's, the regulatory pendulum swung far in favor of strict goals in procuring minority contractors for federal projects. Now the tone of Congress and the nation indicates that the regulatory pendulum will start to swing back the other way, through modifications of MBE regulations.

## CHAPTER EIGHT OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) REGULATIONS

### IMPACT OF OSHA REGULATIONS ON THE CONSTRUCTION INDUSTRY

Job awareness and jobsite safety practices came more into the public view in the 1960's and 1970's and the news media and published articles made more and more Americans acutely aware of job hazards. Major construction jobs were rapidly increasing in complexity and project award amounts began to reach into the billions of dollars. Worker fatality and disabling injury rates in the construction industry were significantly higher than the national average. Congress, therefore, enacted the Occupational Safety and Health Act in 1970 and also established an agency to oversee the program. Unfortunately, to most contractors this piece of legislature and its agency appeared to be punitive, emphasizing rules, regulations, and fines.

Data compiled in a 1979 report by the U.S. Department of Labor showed that the construction industry which consists of only 5 percent of the total national employment, accounted for approximately 19 percent of all work related fatalities. The major cause of deaths were falls, 26 percent; industrial vehicles or equipment, 15 percent; and over-the-road vehicles, 15 percent. Additionally, almost 30 percent of all the deaths from contact with electric currents occurred to workers in construction.

The report indicated that occupational injury rates (sum of non-lost and lost workdays) for industry divisions per 100 full-time workers ranged

from 2.1 in finance, insurance, and real estate to 16.0 in construction. Lost workday injury rates (using the same methodology) was found to be 7 times greater in the construction industry than in the areas of finance, insurance, and real estate. The severe injury rate was also found to be nine times greater than those other industries.<sup>21</sup> These statistics are not as dramatic as they seem to be when one considers the nature and risks involved in the work areas used for comparison. When the construction industry was compared against another hazardous industry, such as mining, the injury rates for the construction industry were found to be lower than in the mining industry. OSHA's position was that the value of human life far exceeded any industry costs to implement safety programs, and, therefore, established more regulations with stiffer penalties and required more documentation by construction companies. OSHA attempted to identify and reduce the physical hazards at the work site, however, it neglected to consider worker behavioral patterns and management factors that contribute to the accident rate. Probably the two greatest shortcomings were that 1) OSHA created an adversarial relationship between the contractor and his employees in the area of safety and 2) that OSHA has not substantially reduced the accident rate.

Both owners and contractors generally agree that the number of accidents would not necessarily be greatly reduced even if all hazardous conditions were eliminated from construction sites. They believe that the unsafe acts of the workers themselves are responsible, in part, for roughly 85 percent of all construction accidents.<sup>22</sup> The direct and indirect costs of these accidents has caused significant increases in construction costs and has reduced productivity.

Recent research published by the Business Roundtable's Construction Industry Cost Effectiveness Project in 1982 concluded that construction accidents add approximately 6.5 percent per year to the nation's construction expenditures. It was noted that the low percentage could be explained by the fact that many OSHA regulations which were based on National Consensus Standards were implemented in the early 1970's (much of the capital expense, such as fire suppressions equipment, building modifications, and extensive safety systems, were installed during this time). The OSHA incremental costs were categorized into four classifications as shown in Table 8.1.

Table 8.1

PERCENTAGE OF COSTS

- 56 - OPERATING AND ADMINISTRATIVE
- 37 - CAPITAL
- 6 - RESEARCH AND DEVELOPMENT
- 1 - PRODUCT

Source: Business Roundtable Report A-52, Vol. 1, March, 1979

The 6.5 percent figure includes the effect of direct and indirect costs and is calculated on the basis of the value of industrial, utility, and commercial construction. It should be noted that the report omits all intangible costs and does not include any costs for third party lawsuits against owners.<sup>23</sup> There are distinct monetary incentives as well as humanitarian considerations that would cause the construction industry to reduce work site accidents.



### DATA BASE

In order to obtain a data base for determining the percentage of construction costs spent on complying with OSHA regulations, a questionnaire (Figure 8-1) was distributed to a selected number of contractors by a Purdue University research team. All organizations appearing on "The ENR 400" list received the questionnaire. The ENR 400 represented a combined domestic construction volume of \$79 billion, with individual annual volumes ranging from \$40 million to \$8.5 billion in 1980.

Since a large portion of the construction work done in the United States is done by firms smaller than those listed on "The ENR 400," it was decided to send the questionnaire to a number of organizations not appearing on the list. These small firms might tend to relate to OSHA regulations differently than the larger firms and it was felt that comparing the responses of the two groups would be noteworthy. Organizations appearing in "The OCA Directory," members of the Indiana Constructors, Incorporated (highway, heavy, and utility contractors), and the AGC of Indiana (Building Chapter) were sent the questionnaire.

A total of 273 usable questionnaires representing a volume of \$14.56 billion were returned.

### OSHA BENEFITS AND COSTS

A majority of contractors, ranging from 72% for the Indiana Constructors to 84% for the OCA, felt that OSHA regulations had increased the cost of projects with which they were involved. Most of the firms felt that OSHA regulations applied to the type of work they performed. The survey showed that 63-82% of the firms felt that OSHA regulations

COST OF OSHA REGULATIONS

Have OSHA regulations increased the cost of construction projects with which your organization is involved?

Hardly at all \_\_\_\_\_

Quite a bit \_\_\_\_\_

Substantially \_\_\_\_\_

Do you feel that OSHA regulations benefit:

Yes                  No                  Unsure

- (a) The General Public \_\_\_\_\_
- (b) The Contractor \_\_\_\_\_
- (c) The Construction Worker \_\_\_\_\_
- (d) Others (Please explain) \_\_\_\_\_

---

Yes                  No                  Unsure

Do you feel that the requirements of the OSHA regulations apply to the type of work with which your company is involved?

\_\_\_\_\_

Do good general construction practices usually satisfy OSHA requirements?

\_\_\_\_\_

Should the OSHA regulations be modified? If the answer is "Yes", please explain in the comment section below how they may be improved.

\_\_\_\_\_

Do you feel that OSHA regulations have reduced the number and severity of construction accidents on your projects?

\_\_\_\_\_

Continued on the following page

Please list the total project cost and the approximate cost of complying with OSHA on projects with which your organization is involved:

Approx.  
Total Project  
Cost (in \$)

Approx. Cost  
of OSHA  
Regulations  
(in \$)

Buildings (Residential & Commercial)

\_\_\_\_\_

\_\_\_\_\_

Highways

\_\_\_\_\_

\_\_\_\_\_

Heavy (including sewer work)

\_\_\_\_\_

\_\_\_\_\_

Industrial (including power plants)

\_\_\_\_\_

\_\_\_\_\_

Other Causes (Please explain)

\_\_\_\_\_

\_\_\_\_\_

Approximate Annual Construction Cost (in dollars)  
of projects with which your organization is  
involved.

\_\_\_\_\_

COMMENTS

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Figure 8.1

Source: Journal of Construction Engineering and Management, ASCE  
Vol. 109, No. 2, June, 1983.

do not benefit the general public. Sixty-one percent of "The ENR 400" firms indicated that OSHA rules and regulations benefited the construction worker. It was interesting to note that the ENR firms indicated greater OSHA benefits for the general public, contractor, and construction workers than that of the smaller organizations. Also of note is the fact that a majority of the firms felt that good general construction practices usually satisfy OSHA regulations, and that OSHA regulations should be modified.

The percentage of construction costs that was estimated to be allocated for complying with OSHA regulations was 1.3% for Indiana Constructors, 2.41% for the OCA (Ohio) Contractors, and 0.96% for the ENR 400 firms. The data showed that smaller firms perceived that they spent more to comply with OSHA regulations than the larger firms. One reason for this difference may be that the type of work done by the smaller firms is subject to higher surveillance. Another reason may be that larger firms consider some of the OSHA regulations equivalent to normal operating procedures and, therefore, did not compute any extra expenditures. Still another reason may be the perception of OSHA itself, causing contractors to inflate costs due to administrative frustration - this would be more pronounced in a smaller firm.<sup>24</sup>

#### THE AGC REPORT

In a report performed by the Associated General Contractors (AGC) of America in 1983, as a submission to Congress and the White House, they cited several other problems with federal regulations in the construction industry.

1. OSHA requires construction contractors to retain exposure and medical records for up to 30 years, creating a staggering paperwork burden.
2. Although OSHA's asbestos standard for general industry is not workable in the highly variable construction environment, OSHA has not proposed a separate asbestos standard for the construction industry.
3. OSHA has gone beyond the recognized safety rules for the construction industry to propose an overly restrictive and burdensome standard for crane or derrick suspended personnel platforms.
4. OSHA's policy on repeated violations requires its field personnel to treat construction contractors' separate work sites as if they were a single worksite.
5. OSHA has proposed an overly broad standard on underground construction, one ignoring significant differences among underground construction operations, such as work associated with tunnels and shafts.<sup>25</sup>

The AGC has felt that these and other federal regulations have caused an increase in costs on construction projects.

It was interesting to note that most contractors (both small and large firms) indicated in a study that in the five year interval between 1976 and 1981, that they were spending less on complying with OSHA regulations. This may be due to a change in OSHA enforcement policies or a change in contractors' operating procedures. The Bureau of Labor Statistics showed that during that same time period (1976-1981), the accident rate in construction had not substantially changed.

Owners and contractors both agree that a behavioral approach to safety may yield more substantial results in reducing accidents. A number of contractors have found that a good safety record gives them a competitive advantage. Reducing the accident rate by eliminating the risk and danger from job sites directly affects the workers' compensation



experience rating of the company, and thereby lowering the insurance premiums charged to the firm. The discounted insurance rates may return considerable dividends to the contractor. The direct cost of accidents is usually reimbursed by workers' compensation insurance. Construction accidents, however, generally involve substantial hidden costs such as unproductive labor time, disrupted schedules, work slow-downs, reduced expertise, and lowered morale. In a study performed by M.R. Robinson of Stanford University in 1979, he indicated that companies have found that indirect costs of accidents have been as much as 17 times higher than direct costs.<sup>26</sup> Other studies were far more conservative in their direct costs/direct costs ratio, however, all studies agree that indirect costs exceed direct costs.

Many organizations have found that incentive programs have been effective in motivating workers to achieve good safety records. Prizes and awards are given to workers with either short or long-term safety records. These are awarded during an appropriate ceremony which is attended by both workers and management.

Research has indicated that the attitude of management and supervision can have a significant impact on reducing accidents. Studies involving the efforts of top management, middle management, and foremen have concluded the following in effectively reducing jobsite accidents:

1. Accept personal responsibility for improving safety and for eliminating or correcting unsafe working methods or conditions.
2. Communicate and show a real concern for safety.
3. Keep job pressures low and avoid crisis situations through effective planning.
4. Orient or train workers, or both, to the company or the job.<sup>27</sup>

OSHA has begun to recognize that the accident rate is directly tied to safe operating procedures as well as labor motivation and management concerns, therefore, OSHA has initiated innovative methods to reduce worksite injuries. In an attempt to change the adversarial relationship between labor and management, OSHA approved in 1979, the construction industry's first experiment in formal, voluntary, labor-management safety inspections. The project chosen was the San Onofre Nuclear Power Plant for which the Bechtel Power Corporation was the construction manager. At the site a voluntary committee assumed all responsibility for routine safety compliance and accident prevention. Two Bechtel representatives and two union members performed all the day-to-day inspections. Monitoring of any complaints or violations was still performed by OSHA, and they were available to handle any serious hazards. The San Onofre experiment was a success and as a result two other sites have been chosen to expand the program. One site is a coal-fired power plant in Colorado, and the other is a manufacturing/administrative building in California. These experiments have been a positive step toward recognizing the capabilities and responsibilities of both management and labor in reducing worksite accidents. It also provided for additional responsibilities for union members to use their construction know-how and experience to prevent accidents. The benefits from these innovative ideas are reduced accident rates, improved productivity, lower construction costs, and reduced workers' compensation charges.

#### SUMMARY

As studies have shown, the costs (both indirect and direct) of construction accidents are large. Accident costs are approximately

5.5 percent of the nation's construction expenditure. Surveys show that construction firms perceived a reduction in expenses for complying with OSHA regulations during the five year period of 1976-1981. The decrease in construction cost was 1.3% for Indiana Constructors, 2.41% for the OCA (Ohio) Contractors, and 0.96% for the ENR 400 firms.

There was an overwhelming opinion by all firms that OSHA regulations should be modified. OSHA has made a concerted effort to reduce the administrative burden and to allow labor and management to become more involved in accident prevention. Statistics have shown that OSHA's actions to date have not substantially contributed in reducing the worksite accident rate. Many firms believe that good management practices would be equivalent to OSHA regulations, with a reduction in costs, however, Congress saw the need for establishing OSHA only because the industry was abusing the system and wasting natural resources. The question is still a political one and cost/benefits of public welfare versus profit will continue to be debated.

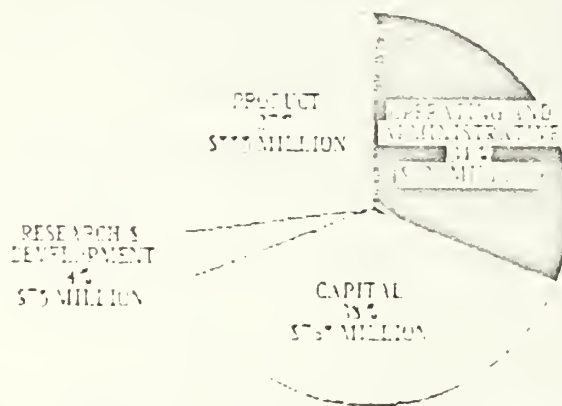
CHAPTER NINE  
ENVIRONMENTAL PROTECTION AGENCY (EPA) REGULATIONS

IMPACT OF ENVIRONMENTAL PROTECTION AGENCY REGULATIONS ON THE CONSTRUCTION  
INDUSTRY

The Environmental Protection Agency established in 1970, is designed to serve as the public's advocate for a clean and livable environment. It is also responsible for the establishment and enforcement of environmental standards and for administering federal laws on environmental control.

Environmental groups have developed large and effective lobbying efforts and have artfully used the news media to create public awareness to environmental problems. The uncontrolled abuse of America's natural resources by industrialists during the first half of the 20th century caused public opinion to swing in the extreme favor of strong environmental regulations by the 1970's. As a result the Environmental Protection Agency staff grew from approximately 4,500 employees in 1970 to over 13,000 employees by 1979. Congress has poured more than \$260 billion in cleanup measures over the last ten years. In a 1979 Business Roundtable Report, performed by Arthur Anderson and Company, they reported that the cost of complying with EPA regulations by firms participating in the study was well over \$2 billion. This investment accounted for 77% of all costs of complying with federal regulations during that year. Figure 9-1 shows a breakdown of the incremental costs by classification. It was found that approximately 90% of the incremental costs were attributable

FIGURE 9-1 EPA INCREMENTAL COSTS SUMMARIZED BY CLASSIFICATIONS



TOTAL EPA INCREMENTAL COSTS \$24.0 MILLION

SOURCE: BUSINESS ROUNDTABLE REPORT, 12-14-67, 1-11-68, 1-11-68

to air and water regulation. The participating firms reported that because of the complexity and volume of EPA regulations they incurred over \$36 million, primarily, in salaried labor costs, solely to maintain internal environmental programs and to keep current with existing regulations and practices and to prepare for new regulations.

In the interest of public safety, Congress mandated legislature such as the Clean Air Act and the Water Control Act with rigid standards, and the EPA acted aggressively to ensure that firms were in strict compliance with these laws.

Most firms have made a conscientious effort to comply with environmental regulations, but have begun to question if the additional costs outweigh the benefits. Companies have reported that while reasonable measures should be taken to protect the environment, small increments of improvement are often obtained at great cost. For example, in the mid-1960's, a company installed precipitators for the collection



of fly ash that removed 95% of the particulates emitted from one of its plants. In order to comply with the Clean Air Act, the company was required to increase its efficiency so that 99.4% of the particulates were removed. Since that degree of efficiency could not be obtained with its existing precipitators, it was necessary to replace them with new ones at approximately twice the cost of the original precipitators. As a result the net reduction of less than 5% of particulate emission was achieved at twice the cost needed to achieve the first 95%.<sup>28</sup>

A similar case was made by Mr. William Moorehead, Chairman of the Subcommittee on Economic Stabilization. In the U.S. House of Representatives; during testimony, he stated:

Now back to the regulatory problems; and at this point, having rapped the steel industry sufficiently, I think it time to show that this subcommittee is not one-sided and that we are concerned about the costs to the steel industry so that it can remain competitive with foreign products.

I don't think the page numbers of your testimony (Mr. William Lilley) and mine coincide, but you do talk about the examples from environmental regulations, EPA regulations concerning the discharge of water, effluence by the iron and steel industry. This is one of the places where you talk about alternatives, and you noted the best practicable technology studies in 1977 would generate large benefits in relation to cost; but moving ahead those standards to the best attainable technology standards in 1983 would result in monumental cost with only marginal benefits.

I have before me an internal memorandum from the Environmental Protection Agency which I think demonstrates this rather dramatically in figures. I will read those figures to you and see if they are in the order of magnitude you were talking about:

For total suspended solids under the best, the present practicable technology, if you remove 94.8 percent, the cost per pound is 65 cents; whereas, the alternative, removing 92.3 percent, the cost is only 43 cents per pound.

I am not suggesting which. It is not the jurisdiction of this committee to say whether 94.8 percent or 92.3 percent should be the goal, but it is, I think, our function to point out the differences between the 65 cents and 43 cents.

But then when you move ahead to the best attainable technology, (1983) the differences become, as you say in your statement, monumental. The cost of removal of 100 percent of the total suspended solid by the best attainable technology jumps to \$16.71 for the marginal increase from approximately 95 percent to 100 percent.<sup>29</sup>

The need for the EPA to set accurate, cost-effective standards is critical to its impact on the economy. If not performed with foresight and prudence, by the stroke of a pen many small firms could be regulated right out of business.

#### ENVIRONMENTAL IMPACT STATEMENTS

Incorporated into the National Environmental Policy Act of 1970, is the Environmental Impact Statement (EIS), stating that "major federal actions significantly affecting the quality of the human environment" shall require a "detailed statement" of impacts, resources needed, and alternatives available.

The Environmental Impact Statement gave the environmental movement a catalyst which caused the nation to pay more attention to the environment. As a result of the 1970 Environmental Policy Act, any project that required federal funding or licensing, i.e., dams, highways, sewers, housing projects, and power plants had to provide an acceptable EIS. The EPA quickly moved to halt any project that lacked or contained unacceptable EIS's. As part of the process of making a "detailed statement" firms found the EIS to be voluminous, time-consuming, and very costly. The EPA would fine corporations or reject their EIS all together if the EIS was lacking.

In addition, over 50% of the state legislatures enacted laws requiring EIS at the state level, which unfortunately overlapped or duplicated federal requirements, thereby increasing preparation and processing costs. The EIS has resulted in the generation of a multi-million dollar industry involving environmental analysts and consultants.

The cost of compiling and processing environmental impact statements are staggering. The Bureau of Reclamation reported for fiscal year 1977, the cost of compliance was \$4.8 million. That figure did not include the cost to the contractor in implementing environmental controls.

The preparation of the EIS has become a major component of the contractors' bid package, and its cost is a critical criterion in determining whether to proceed with a project. The excessive cost of the EIS caused the Dow Chemical Company to abandon its plans to build a new Petrochemical Plant on the Sacramento River in California.

Mr. Robert Perry of Dow Chemical commented:

There is much redundancy in the environmental impact report process. Continued expansion of exposure through the permit granting process allows any project to be delayed because of inadequate treatment or environmental questions.<sup>30</sup>

The Dow Chemical Company had spent \$4 million on environmental impact studies and permits during the two years it had attempted to gain approval for the project.

Mr. Karl L. Rothermund, Jr., Executive Vice President of the Ohio Contractors Association has stated: "It takes approximately 13-18 months to prepare and process an EIS in Ohio." He also stated that in certain instances, it now costs as much money and time to

prepare and review an EIS as to do the engineering design for a highway job.<sup>31</sup>

As previously stated, the EIS has a tendency to be comprehensive and costly. It has been reported that the EIS of a natural gas pipeline from Alaska to the lower United States was a 17 volume document containing 9,570 pages. The EIS for a proposed Everglades Jetport cost \$1.3 million. Additionally, the EIS for the Westway Project in New York reportedly cost \$16 million.<sup>32</sup>

#### REDUCING EIS COSTS

On the positive side, the General Accounting Office has studied the EIS and has issued a number of findings which, if incorporated into federal law, should make the review process somewhat faster and more consistent, thereby resulting in tremendous cost savings to the construction industry. The industry itself is also now being asked to incorporate environmental considerations into the early planning phase of projects where possible questionable impacts may be studied and eliminated before actual physical damage is done, and before millions of dollars are poured into a project that will never get off the ground. The National Association of Environmental Professionals, an organization of individuals involved with writing Environmental Impact Statements, has recently considered the adoption of a code of ethics intended to limit biased work. The EPA is developing new guidelines designed to reduce delays in its permit granting programs. As a result of the Dow Chemical problem, the California Legislature has made proposals to modify the California Environmental Quality Act, and limit environmental impact reports. Consequently, many states have followed suit in modifying their environmental laws.



### OVERALL EPA COSTS

In a report performed by Koenn, Benson, and Shank in 1978, they approximated the construction cost for social and environmental controls. They sent a questionnaire to firms listed on "The ENR 400," which represented a total construction volume of \$65 billion. Smaller firms that were listed in the OCA Directory (Ohio Contractors Association) were also sent questionnaires. The ENR 400 firms reported that 2.4% of their construction cost, and the OCA firms reported that 3.7% of their construction cost, were spent in complying with Environmental Protection Agency regulations. It was interesting to note that a majority of the firms responded that they felt that EPA regulations benefited the general public.<sup>33</sup>

### SUMMARY

The EPA acts as a watchdog for the public to ensure that the present generation and future generations will have a clean and livable environment. Largely due to abuses caused by industrialists was the EPA formed. It became in the best interest of the general public to regulate those who were adversely affecting the environment.

There have been numerous studies showing the affects of EPA regulations on the construction industry. By an overwhelming majority most firms agree that EPA regulations increase their construction cost. They also tend to agree that these regulations also benefit the general public. The controversy lies in the cost/benefits of the EPA regulations. Most firms can live with tolerable standards, but studies have shown that the incremental costs of getting those "last 5%" are monumental. As a result, careful study needs to be given to set accurate and



reasonable standards. The EPA must continue to be the public's advocate for environmental matters and at the same time be acutely aware of its impact on the economy. During the 1970's, the pendulum swung far in favor of strong environmental controls caused by an overwhelming public outcry. Now that the fanfare has died down, many in the present administration and Congress are seriously looking at ways to reduce construction cost through modifying EPA regulations.

## CHAPTER TEN REGULATORY REFORM

The annual budget for the 57 major federal regulatory agencies had grown from \$800 million in 1970 to over \$3.0 billion by 1980. Likewise, the administrative staffs for these agencies swelled from 27,700 in 1970 to 90,500 by 1980.<sup>34</sup> Clearly, the regulatory mechanism itself was putting a tremendous strain on the taxpayer and was causing a significant hardship on the construction industry.

With the rapid growth of governmental regulations there has also been a growing concern that regulatory agencies have been over-zealous and restrictive. Many construction firms have felt regulations to be redundant and confusing. Added uncertainties caused contractor risk to increase thereby causing his bid prices to rise to cover his risk. Ultimately, those costs were (and are) passed on to the consumer.

### EFFORTS TO REFORM BY PRESIDENT CARTER

Although regulatory reform efforts are not a new idea, the most recent surge of reform was started near the end of the Carter administration. President Carter's regulatory reform proposals fell into three broad categories.

1. Review the justifications for existing and proposed rules. The idea was that a rule should not be promulgated unless its benefits clearly outweighed its cost. President Carter made that requirement explicit by Executive Order. He required agencies to explain in detail why a

proposed rule was needed, to estimate its impact on the economy by performing cost/benefit analyses, and to outline alternative solutions.

2. President Carter emphasized that regulators would be held more accountable to Congress, the courts, and to the executive branch.

3. Increased controls over regulatory actions should be given to the President. Allow the President more authority to increase or decrease the power of executive agencies.

President Carter used the industry-by-industry approach to score major successes in the area of regulatory reform. In 1978, he established the Regulatory Analysis Review Group in an attempt to improve government cost/benefit analyses of existing regulations.

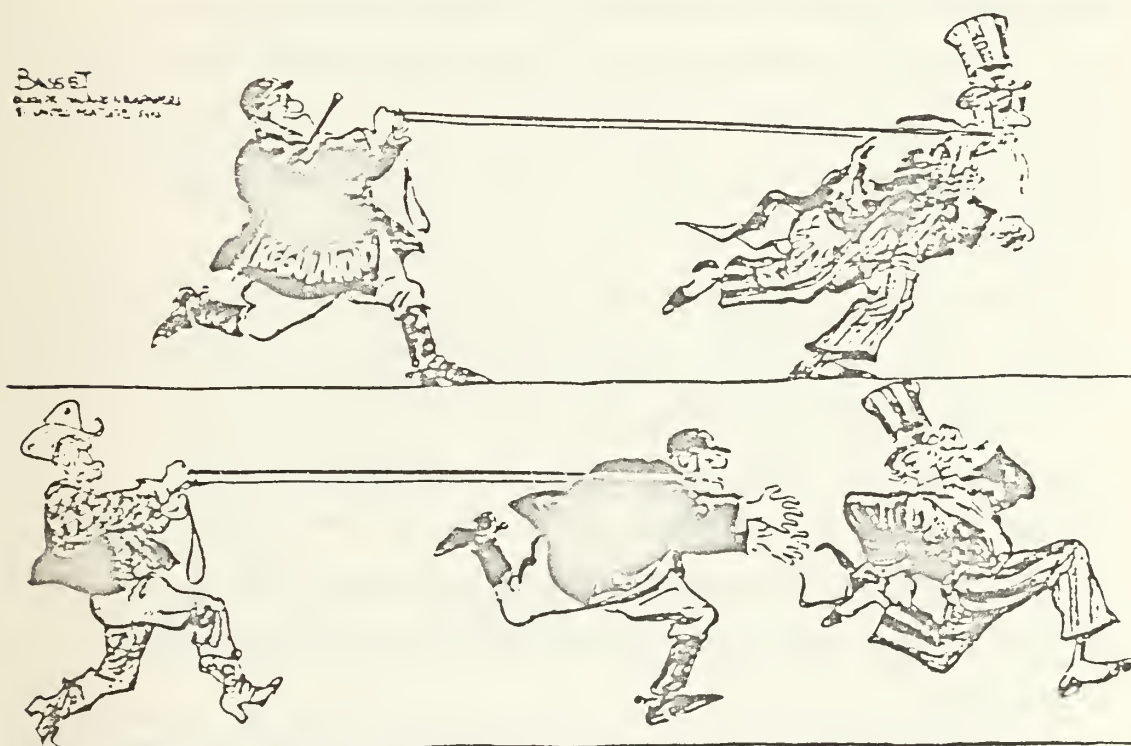
Although some agency heads wanted to expand some forms of regulation, many of them also took steps to streamline the internal operations of their agencies and to reduce regulations. By December 1977, OSHA had abolished 1,100 of its more than 10,000 rules. By March 1979, the Department of Health, Education and Welfare had eliminated 300 pages of rules, and the FTC had cancelled 145 of its rules. President Carter's major push was in the area of deregulation for many industries, such as airlines, transportation, banking, and petroleum.

#### EFFORTS TO REFORM BY PRESIDENT REAGAN

A part of President Reagan's campaign pledge was deregulation, therefore, as soon as he took office he began an attack on the regulatory maze. The President concentrated on a series of executive actions that could be implemented more quickly than legislation. White House aides and Congressional Republicans also drafted bills to revamp basic agency laws, streamline the bureaucracy and make executive actions part of permanent legislation.

### REAGAN'S EXECUTIVE ACTIONS

Just two days after being sworn in as the nation's 40th President, Reagan announced the creation of a Presidential Task Force on Regulatory Relief, chaired by Vice President Bush. Reagan directed the task force to review major regulatory proposals, assess regulations already on the books, oversee the development of legislative proposals, and make recommendations on regulatory personnel and how to reform regulations.



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Bush said the task force would be guided by three general principles:

- (1) Federal regulations should be initiated only when there is a compelling need.

(2) Alternative regulatory approaches (including no regulation) should be considered and the approach selected that imposes the least possible burden on society consistent with achieving the over-all statutory and policy objectives.

(3) Regulatory priorities should be governed by an assessment of the benefits and costs of the proposed regulations.

The White House imposed greater control over regulation by establishing strict new rules on cabinet and agency regulators and gave the Office of Management and Budget (OMB) extensive powers over the regulatory apparatus. The President issued Executive Order 12291, which replaced Carter's Executive Order 10244, requiring executive agencies to prepare a regulatory impact analysis for all new and existing major regulations.

OMB was given authority to identify duplication, overlap, and conflict in rules, which agencies were then required to rectify, develop procedures for cost/benefit analysis, recommend changes in laws authorizing regulatory activity, monitor compliance with executive orders, and schedule existing rules for agency review. In 1981, OMB reviewed a total of 2,803 regulations and found 87% of these regulations to be in compliance. In 1982, OMB reviewed a total of 1,506 regulations and found 85% to be in compliance.

Among the weapons that President Reagan used to attack the federal regulatory bureaucracy, none was wielded more broadly than the budget-cutting ax. In Fiscal Year 1982, 57 regulatory agencies received budget cuts, with a 9% reduction in the staff. The 1983 Fiscal Year Budget saw a spending cut of 7% and a staff reduction of 3%. The President has acted



very conservatively and threatened to cut out entire agencies. He has continually curbed regulatory enforcement of existing rules and disestablished the requirements of goals and quotas, however, areas of major environmental concerns have not been effected.

The Bush Task Force reported that savings to industry derived from 51 revisions totaled at least \$6 billion in annual recurring costs, and an additional \$9-11 billion in one-time capital investment costs. They claimed that the administration had reduced the paperwork burden imposed by the government by more than 200 million manhours.

#### OUTLOOK

During the President's second term in office, there has been a definite slowdown in regulatory reform; however, many of the proposed and final regulations issued by the Reagan administration have been to revise rules already on the books, rather than to add new ones. Others speculate that because of stringent controls by OMB, agencies are discouraged from submitting proposals that would be unlikely to survive OMB scrutiny.

Some critics of the administration feel that the President has created a regulatory agency (in the OMB) to regulate the other regulatory agencies. By giving OMB such broad powers, the President has his own personal staff of regulators.

Late in 1982, the administration proposed a comprehensive regulatory reform bill, but was dashed when Congress failed to act on it before they recessed.<sup>35</sup> The President was not deterred however, and has continued to propose a budget cut in almost every area. Some of the more famous legislative actions being supported by the administration

have been the Gramm-Rudman-Hollings Balanced Budget Act, and the Packard Tax Reform Bill.

Indications are clear that the Reagan administration has not vanquished in its battle for regulatory reform: it has only been catching its breath for the next round. Both the administration and Congress must be sensitive to the public's perception of regulation and the influence of a multitude of special interest groups that include business, labor, consumers, environmentalists, and a variety of special interests. Moreover, for all the criticism, government intervention in the American economy is not likely to go away any time soon. While most people agree that the system needs reform, few advocate dismantling the apparatus that has brought so many benefits to the U.S. economy and society.

## CHAPTER ELEVEN CONCLUSION

The construction industry is in fact one of the most competitive industries in the United States, therefore, contractors and owners alike have to sharpen their pencils and accurately estimate the cost of construction projects. Not only are labor, material, and equipment major factors that go into a bid, but also overhead and administrative costs have taken a more significant part in cost estimates in the last twenty years. Studies have shown that approximately 10% of the yearly construction costs are allocated to regulatory controls, and the annual budget for the sum total of regulatory agencies is in the billions of dollars. Due to the swing of the social pendulum, regulatory agencies saw tremendous growth in the 1960's and 70's. The federal government acting in the "best interest" of the public sought to put a halt to the wanton abuse of America's natural resources, discriminatory and monopolistic business practices, and unsafe and unorthodox working conditions.

In order to comply with the new regulatory controls many construction firms had to reorganize, reschedule, and retrain both management and its workers. Some firms felt that the new regulations were unfair and so harsh that they plain resisted any change. Not only did most firms experience expensive capital outlays to procure equipment that would comply with OSHA and EPA rulings, but they also found that it was necessary to hire an administrative staff to monitor and coordinate

voluminous recordkeeping requirements that were set by the regulatory agencies to prove that the firm was in compliance.

As the social pendulum reached its zenith, the President increased the authority of certain agencies in order to put an immediate halt on undesired practices. Consequently, several agencies began to impose strict and severe penalties on violators, and used heavy-handed tactics to force compliance. Construction firms reported a marked increase in recruiting and training costs. Wage scales steadily increased and the inflation of the 1970's caused contractors to be more risk adverse. These factors and others caused the construction competition to grow keener, and even though the EEOC had affirmative action and MBE programs, any untrained and ill-prepared contractor found himself soon out of business.

The debate over regulatory reform continues to rage. The Davis-Bacon Act, the MBE program, and EPA and OSHA rulings, just to name a few, are constantly before Congress and in the media. There have been many studies done on each area of construction and they have concluded that there are substantial costs associated in complying with federal regulations. A closer look at these studies show that each study starts with basic assumptions (because of the complex nature of the issue) and then they proceed. Opposing analysts of the studies attack those assumptions to prove just the opposite, allowing the debate to continue. The conclusion that they all agree on (just as good analysts should) is that more study is needed on the subject.

This paper has presented the facts as they were found, allowing both positive and negative aspects to be presented. The reader is allowed to draw his or her own conclusions about the subject. In

conducting research for the paper I interviewed Mr. Patrick McCauley of the Commerce Department in Washington, D.C., and when asked how he felt about the impact of federal regulations on the construction industry he commented:

(paraphrased) ...that is an interesting topic and is very political, and I do not want to take sides on the issue...

I personally conclude that our form of government and our society must have regulations. Those regulations must be prudent, cost-effective, and in the best interest of the general public. It is nearly impossible to put an accurate value on time, human life, and a clean environment, therefore, statistics can be misleading. I do feel that the regulatory budget has gotten way out of hand, and that the regulatory process itself is inefficient and is the real cause of increased cost to the consumer.



## REFERENCES

1. Federal Regulatory Directory 1983-84, Congressional Quarterly Inc., Washington, D.C., 1983, pp 2-3.
2. Federal Regulatory Directory 1981-82, Congressional Quarterly Inc., Washington, D.C., 1981, p 7.
3. Ibid., pp 7-8.
4. Ibid., pp 10-60.
5. Koehn, Enno M., Benson, R.E., Jr., and Shank, D., "Cost of Social and Environmental Regulations in Construction," Journal of the Construction Division, ASCE, Vol. 104, No. C02, Sept., 1978, pp 117-122.
6. "Bearish Markets in '82 Should Hold Inflation to 1981 Level," Engineering News Record, Dec. 17, 1981, p 77.
7. Stukhart, George M., "Inflation and the Construction Industry," Journal of the Construction Division, ASCE, Vol. 108, No. C04, Dec. 1982, pp 546-548.
8. Lilley, William, III, Testimony Before The Subcommittee on Economic Stabilization, of the Committee on Banking, Currency and Housing, House of Representatives, 94th Congress, 2nd Session, Dec. 17, 1976, U.S. Government Printing Office, Washington, D.C., 1977, pp 13-49.
9. De Neufville, R., Hani, E.N., and Lesage, Y., "Bidding Models: Effects of Bidders' Risk Aversion," Journal of the Construction Division, ASCE, Vol. 103, No. C01, Proc. Paper 12795, Mar. 1977, pp 57-70.
10. Erikson, C. A., O'Connor, M. J., and Rood, O. E., "Preliminary Investigations of Risk Sharing in Construction Contracts," Interim Report P-88, U.S. Army Construction Engineering Research Laboratory, Champaign, IL, Apr. 1978.
11. "Industrial Wage Survey: Contract Construction," Bulletin No. 1911, United States Bureau of Labor Statistics, United States Government Printing Office, Washington, D.C., 1976.
12. Logcher, R. and Collins, W., "Management Impacts on Labor Productivity," Journal of the Construction Division, ASCE, Vol. 104, No. C04, Proc. Paper 14235, Dec. 1978, pp 447-461.
13. Levitt, Raymond E., and Bourdon, Clinton C., "Cost Impacts of Prevailing Wage Laws in Construction," Journal of the Construction Division, ASCE, Vol. 105, No. C04, Dec. 1979, pp 281-287.

14. "Federal Regulatory Areas That Negatively Effect the Construction Industry," Associated General Contractors of America, Washington, D.C., 1983.
15. Koehn, E. and Jones, M. W., "Benefits and Costs of EEO Rules in Construction," Journal of Construction Engineering and Management, Vol. 109, No. 4, Dec. 1983, pp 435-445.
16. Cost of Government Regulations Study, The Business Roundtable, New York, N.Y., Report A-52, Vol. 1, March 1979, pp 28-33.
17. "Federal Regulatory Areas That Negatively Effect the Construction Industry," Associated General Contractors of America, Washington, D.C., 1983.
18. Special Provisions-Minority Business Enterprise, Indiana Highway Commission, Indianapolis, IN, July 1, 1982.
19. Chastain, R., "What's Wrong With Present MBE Programs," Presented at the October 1982 Annual ASCE Convention held at New Orleans, LA., Journal of Construction Engineering and Management, ASCE, Vol. 110, No. 2, June, 1984, p 237.
20. Koehn, Enno M., and Espaillat, Cesar, H., "Cost and Benefits of MBE Rules in Construction," Journal of Construction Engineering and Management, ASCE, Vol. 114, No. 2, June 1984, pp 235-247.
21. Koehn, Enno M., and Musser, Kurt, "OSHA Regulations Effects On Construction," Journal of Construction Engineering and Management, ASCE, Vol. 109, No. 2, June 1983, pp 233-234.
22. Turner, D. J., "Will OSHA Make the Construction Industry safer?" Civil Engineering, Vol. 42, No. 2, Feb. 1972.
23. Improving Construction and Safety Performance, The Business Roundtable, New York, NY, Report A-3, Jan. 1982.
24. Koehn, Enno M., and Musser, Kurt, "OSHA Regulations Effects on Construction," Journal of Construction Engineering and Management, ASCE, Vol. 109, No. 2, June 1983, pp 236-243.
25. "Federal Regulatory Areas That Negatively Effect the Construction Industry," Associated General Contractors of America, Washington, D.C., 1983.
26. Robinson, M. R., "Accident Cost Accounting as a Means of Improving Construction Safety," Technical Report, No. 242, Construction Institute, Stanford University, Stanford, CA, 1979.

27. Hinze, J., "Turnover, New Workers, and Safety," Journal of the Construction Division, ASCE, Vol. 104, No. C04, Proc. Paper 14209, Dec. 1978. pp 4090-417.
28. Cost of Government Regulation Study, The Business Roundtable, New York, N.Y., Report A-62, Vol. 1, March 1979. pp 22-27.
29. Moorehead, William S., Testimony Before the Subcommittee on Economic Stabilization, of the Committee on Banking, Currency, and Housing, House of Representatives, 94th Congress, 2nd Session, Dec. 17, 1976, U.S. Government Printing Office, Washington, D.C., 1977, p 70.
30. Perry, Robert, "California at the Crossroads," California Building and Engineer, April 22, 1971.
31. Rothermund, K. L., "The Bureaucratic Shuffle," Ohio Contractor, Vol. XV, No. 10, Oct. 1976.
32. "Viewpoint: New York's Westway - Pro and Con," Engineering News Record, Vol. 200, No. 7, Feb. 16, 1978.
33. Koehn, Enno M., Benson, R.E., Jr. and Shank, D., "Cost of Social and Environmental Regulations in Construction," Journal of the Construction Division, ASCE, Vol. 104, No. C02, Sept. 1978, p 121.
34. "Regulation and the 1985 Budget," Regulation, March/April 1984, p 9.
35. Federal Regulatory Directory 1983-84, Congressional Quarterly, Inc. Washington, D.C., 1983, pp 60-78.

## BIBLIOGRAPHY

"Bearish Markets in '82 Should Hold Inflation to 1981 Level," Engineering News Record, Dec. 17, 1981, p 77.

Chastain, R., "What's Wrong With Present MBE Programs," Presented at the October 1982 Annual ASCE Convention, held at New Orleans, LA, Journal of Construction Engineering and Management, ASCE, Vol. 110, No. 2, June, 1984, p 237.

Cost of Government Pegulation Study, The Business Roundtable, New York, N.Y., Report A-52, Vol. 1, March 1979.

Cushman, Robert E., The Independent Regulatory Commissions, New York, London, (etc.), Oxford University Press, 1941.

DeNeufville, R., Hani, E. N., and Lasage, Y. "Bidding Models: Effects of Bidders' Risk Aversion," Journal of the Construction Division, ASCE, Vol. 103, No. C01, Proc. Paper 12795, Mar. 1977, pp 57-70.

Erikson, C. A., O'Connor, M. J., and Rood, D. E., "Preliminary Investigations of Risk Sharing in Construction Contracts," Interim Report P-88, U.S. Army Construction Engineering Laboratory, Champaign, IL, Apr. 1978.

"Federal Regulatory Areas That Negatively Effect the Construction Industry" Associated General Contractors of America, Washington, D.C., 1983.

Federal Regulatory Directory 1981-82, Congressional Quarterly, Inc., Washington, D.C., 1981, pp 7-60

Hinze, J., "Turnover, New Workers and Safety," Journal of the Construction Division, ASCE, Vol. 104, No. C04, Proc. Paper 14209, Dec. 1978, pp 409-417

Improving Construction Safety Performance, The Business Roundtable, New York, N.Y., Report A-3, Jan. 1982.

"Industrial Wage Survey: Contract Construction," Bulletin No. 1911, United States Bureau of Labor Statistics, United States Government Printing Office, Washington, D.C., 1976.

Interview with Mr. Patrick MacCaule, Educational Services, U.S. Commerce Department, Washington, D.C., on May 1, 1986.

Koehn, Enno M., Benson, R. E., Jr., and Shank, D., "Cost of Social and Environmental Regulations in Construction," Journal of the Construction Division, ASCE, Vol. 104, No. C02, Sept. 1978.

Koehn, Enno M., and Espaillet, Cesar, A., "Cost and Benefits of MBE Rules in Construction," Journal of Construction Engineering and Management, ASCE, Vol. 110, No. 2, June 1984.



Koehn, Enno M., and Jones, M. W., "Benefits and Costs of EEO Rule in Construction," Journal of Construction Engineering and Management, Vol. 149, No. 4, Dec. 1983.

Koehn, Enno M., and Musser, Kurt, "OSHA Regulations Effects On Construction," Journal of Construction Engineering and Management, ASCE, Vol. 109, No. 2, June 1983.

Levitt, Raymond E., and Bourdon, Clinton, C., "Cost Impacts of Prevailing Wage Laws in Construction," Journal of the Construction Division, ASCE, Vol. 105, No. C04, Dec. 1979.

Lilley, William III, Testimony Before the Subcommittee on Economic Stabilization, of the Committee on Banking, Currency, and Housing, House of Representatives, 94th Congress, 2nd Session, Dec. 17, 1976, U.S. Government Printing Office, Washington, D.C., 1977, pp 13-49.

Logcher, R., and Collins, W., "Management Impacts on Labor Productivity", Journal of the Construction Division, ASCE, Vol. 104, No. C04, Proc. Paper 14235, Dec. 1978.

Moorehead, William S., Testimony Before the Subcommittee on Economic Stabilization, of the Committee on Banking, Currency, and Housing, House of Representatives, 94th Congress, 2nd Session, Dec. 17, 1976, U.S. Government Printing Office, Washington, D.C., 1977, p 70.

Perry, Robert, "California at the Crossroads," California Builder and Engineer, April 22, 1971.

"Regulation and the 1985 Budget," Regulation, March/April 1984, p 9.

Robinson, M. R., "Accident Cost Accounting As A Means of Improving Construction Safety," Technical Report, No. 242, Construction Institute, Stanford University, Stanford, CA, 1979.

Rothermund, K. L., "The Bureaucratic Shuffle," Ohio Contractor, Vol. XV, No. 10, Oct. 1976.

Smith, Adam, The Wealth of Nations, New Edition Printed for Oliver G. Cooke, Lincoln and Gleason, Printers, 1804.

Special Provisions-Minority Business Enterprise, Indiana Highway Commission, Indianapolis, IN, July 1, 1982.

"Study on Federal Regulations," U.S. Senate Governmental Affairs Committee, Vol. 1, Jan. 1977.

Stukaart, George M., "Inflation and the Construction Industry," Journal of the Construction Division, ASCE, Vol. 108, No. C04, Dec. 1982.



"Task Force Report on Regulatory Commissions," Hoover Commission Report, U.S. Government Printing Office, Washington, D.C., 1949.

Turner, D. J., "Will OSHA Make the Construction Industry Safer?" Civil Engineering, Vol. 42, No. 2, Feb. 1972.

"Viewpoint: New York's Westway-Pro and Con," Engineering News Record, Vol. 200, No. 7, Feb. 16, 1978.

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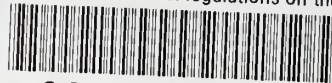
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